2N2218-2N2219
2N2221-2N2222

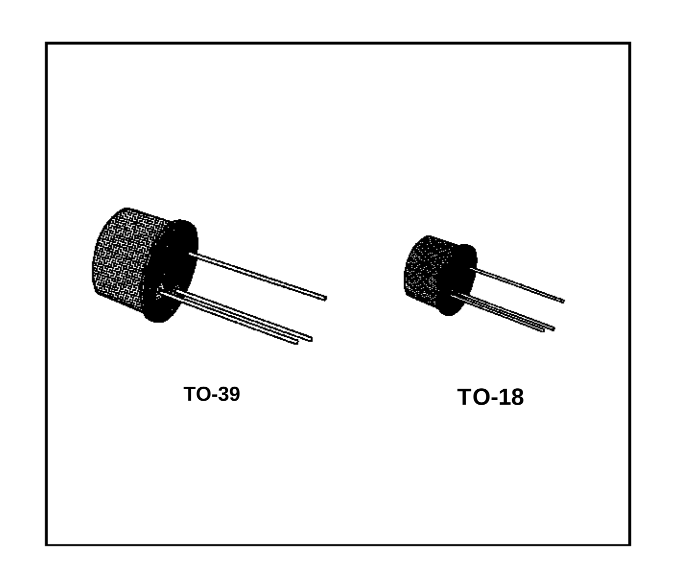
SGS-THOMSON MICROELECTRONICS

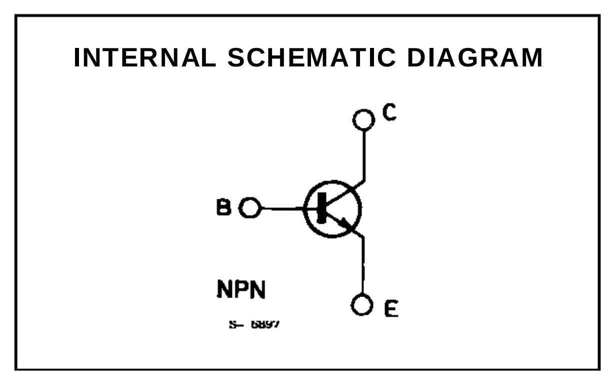
HIGH-SPEED SWITCHES

DESCRIPTION

The 2N2218, 2N2219, 2N2221 and 2N2222 are silicon planar epitaxial NPN transistors in Jedec TO-39 (for 2N2218 and 2N2219) and in Jedec TO-18 (for 2N2221 and 2N2222) metal cases. They are designed for high-speed switching applications at collector currents up to 500 mA, and feature useful current gain over a wide range of collector current, low leakage currents and low saturation voltages.

 2N2218/2N2219 approved to CECC 50002-100, 2N2221/2N2222 approved to CECC 50002-101 available on request.





ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage (I_E = 0)	60	V
V_{CEO}	Collector-emitter Voltage (I_B = 0)	30	V
V_{EBO}	Emitter-base Voltage (I_C = 0)	5	V
I_C	Collector Current	0.8	A
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25$ °C for **2N2218** and **2N2219** for **2N2221** and **2N2222** at $T_{case} \leq 25$ °C for **2N2218** and **2N2219** for **2N2221** and **2N2222**	 0.8 0.5 3 1.8	 W W W W
T_{stg}	Storage Temperature	– 65 to 200	°C
T_j	Junction Temperature	175	°C

THERMAL DATA

			2N2218 2N2219	2N2221 2N2222
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	50 °C/W	83.3 °C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	187.5 °C/W	300 °C/W

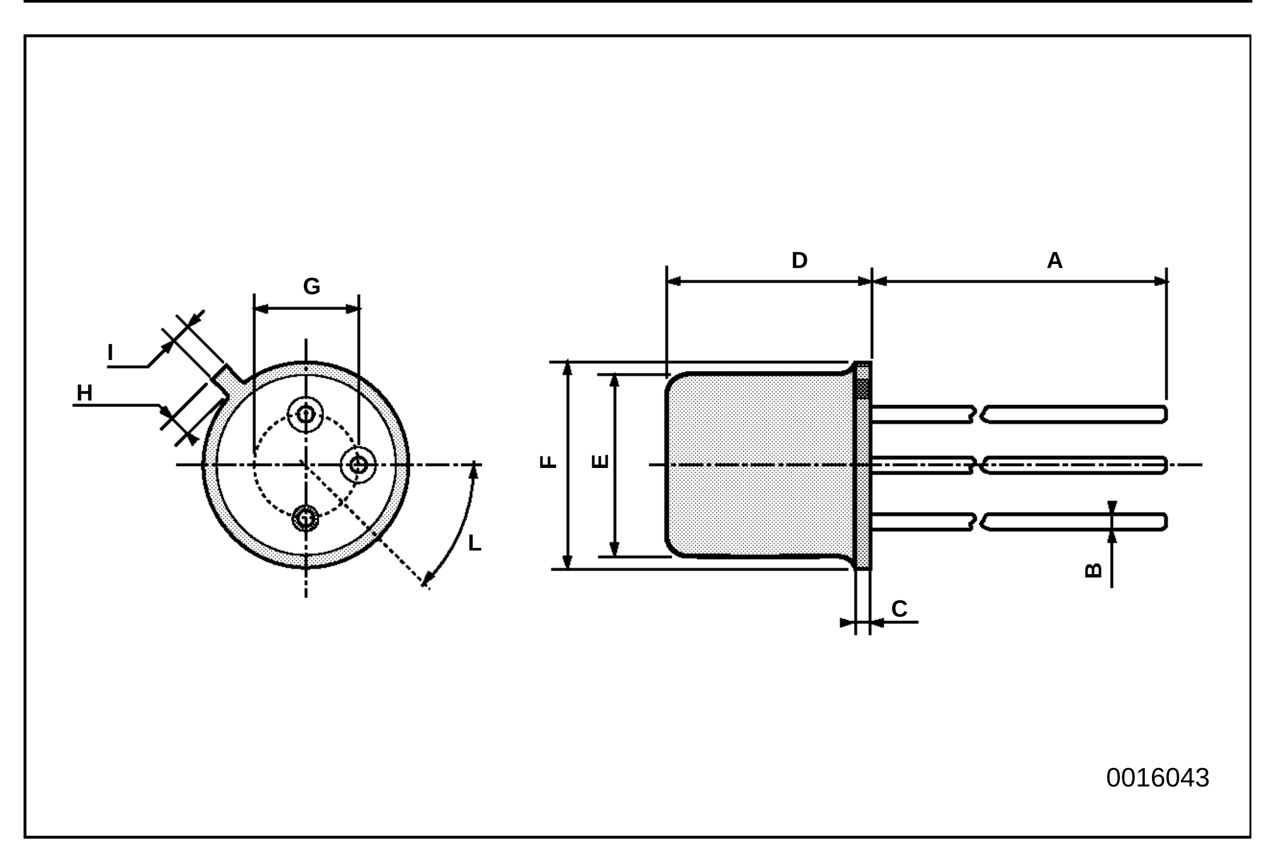
ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	V_{CB} = 50 V V_{CB} = 50 V T_{amb} = 150 °C			10 10	nA μA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 3 V			10	nA
$V_{(BR)\ CBO}$	Colllector-base Breakdown Voltage (I_E = 0)	I_C = 10 μA	60			V
$V_{(BR)CEO}$*	Collector-emitter Breakdown Voltage (I_B = 0)	I_C = 10 mA	30			V
$V_{(BR)\ EBO}$	Emittter-base Breakdown Voltage (I_C = 0)	I_E = 10 μA	5			V
$V_{CE\ (sat)}$*	Collector-emitter Saturation Voltage	I_C = 150 mA I_B = 15 mA I_C = 500 mA I_B = 50 mA			0.4 1.6	V V
$V_{BE\ (sat)}$*	Base-emitter Saturation Voltage	I_C = 150 mA I_B = 15 mA I_C = 500 mA I_B = 50 mA			1.3 2.6	V V
h_{FE}*	DC Current Gain	for **2N2218** and **2N2221**				
		I_C = 0.1 mA V_{CE} = 10 V	20			
		I_C = 1 mA V_{CE} = 10 V	25			
		I_C = 10 mA V_{CE} = 10 V	35			
		I_C = 150 mA V_{CE} = 10 V	40		120	
		I_C = 500 mA V_{CE} = 10 V	20			
		I_C = 150 mA V_{CE} = 1 V	20			
		for **2N2219** and **2N2222**				
		I_C = 0.1 mA V_{CE} = 10 V	35			
		I_C = 1 mA V_{CE} = 10 V	50			
		I_C = 10 mA V_{CE} = 10 V	75			
		I_C = 150 mA V_{CE} = 10 V	100		300	
		I_C = 500 mA V_{CE} = 10 V	30			
		I_C = 150 mA V_{CE} = 1 V	50			
f_T	Transition Frequency	I_C = 20 mA V_{CE} = 20 V f = 100 MHz	250			MHz
C_{CBO}	Collector-base Capacitance	I_E = 0 V_{CB} = 10 V f = 100 kHz			8	pF
$R_{e(hie)}$	Real Part of Input Impedance	I_C = 20 mA V_{CE} = 20 V f = 300 MHz			60	Ω

* Pulsed : pulse duration = 300 μs, duty cyde = 1 %.

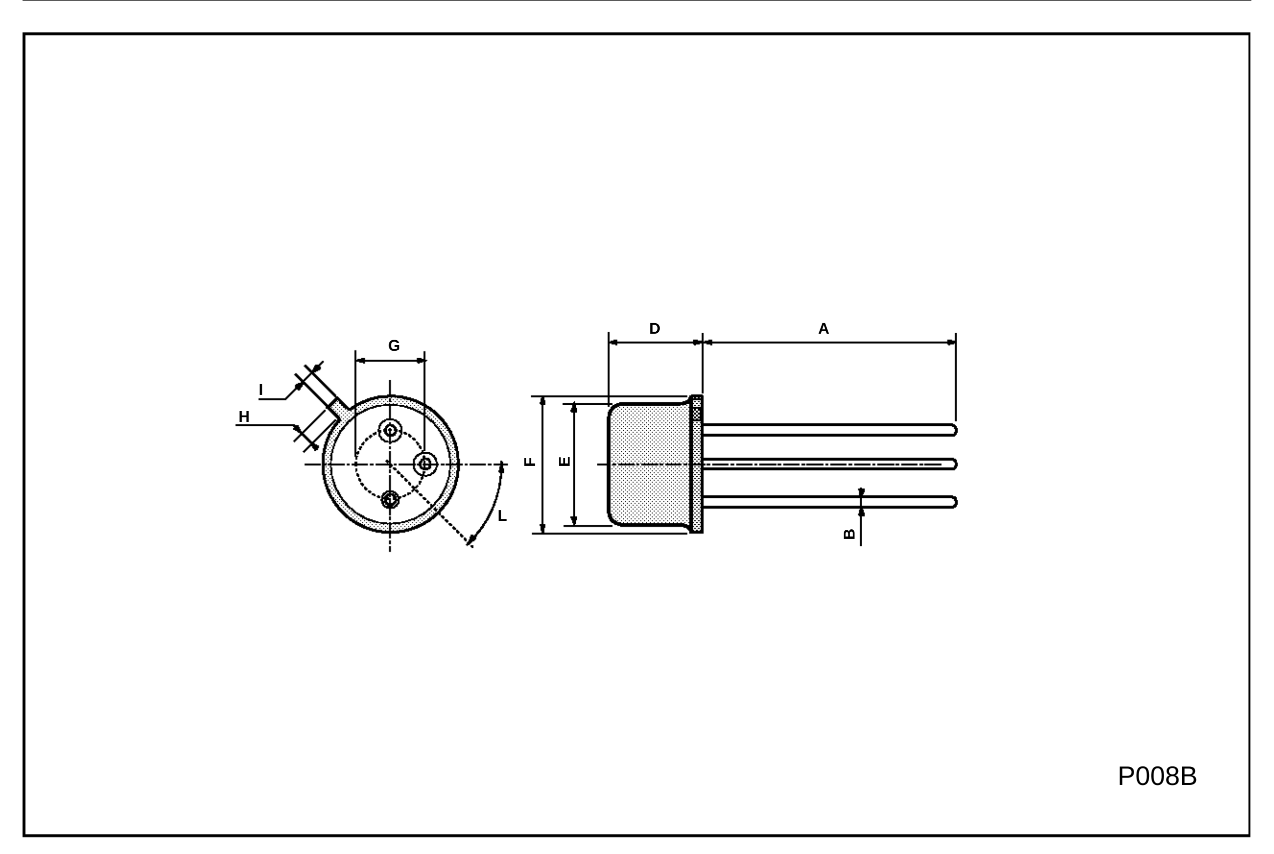
TO-18 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		12.7			0.500	
B			0.49			0.019
D			5.3			0.208
E			4.9			0.193
F			5.8			0.228
G	2.54			0.100		
H			1.2			0.047
I			1.16			0.045
L	45^{o}			45^{o}		



TO39 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	12.7			0.500		
B			0.49			0.019
D			6.6			0.260
E			8.5			0.334
F			9.4			0.370
G	5.08			0.200		
H			1.2			0.047
I			0.9			0.035
L	45^{o} (typ.)					



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